

Claims

- [c1] 1 .A mounting structure for assembling a plurality of optoelectronic components, comprising:
- a first substrate on which at least one first optoelectronic component is arranged, the first substrate being in the shape of a rhombus and having an edge connector disposed on an edge thereof; and
- a second substrate on which at least one second optoelectronic component is arranged, the second substrate being in the shape of a rhombus and having an edge connector disposed on an edge thereof which operatively connects with the edge connector of the first substrate to form an arrangement of the at least one first optoelectronic component and the at least one second optoelectronic component.
- [c2] 2 .The mounting structure as set forth in claim 1 , wherein:
- at least one of the first substrate and the second substrate has a rhombus shape that corresponds to a primitive unit cell of a hexagon.
- [c3] 3 .The mounting structure as set forth in claim 1 , further comprising:
- an interconnecting element that connects with the edge connector of the first substrate and that connects with the edge connector of the second substrate to connect the edge connector of the first substrate with the edge connector of the second element.
- [c4] 4 .The mounting structure as set forth in claim 3 , wherein:
- the first substrate further includes an electrical connection between the at least one first component and the edge connector of the first substrate;
- the second substrate further includes an electrical connection between the at least one second component and the edge connector of the second substrate;
- and
- the interconnecting element electrically connects the edge connector of the first substrate with the edge connector of the second substrate to form an electrical arrangement of the at least one first component and the at least one second component.
- [c5] 5 .The mounting structure as set forth in claim 1 , wherein the first substrate

includes:

a thermally conductive layer; and

a printed circuit board into which the edge connector is formed, the printed circuit board including an electrical path connecting the at least one first optoelectronic component with the edge connector.

[c6] 6. The mounting structure as set forth in claim 5, wherein:
the at least one first optoelectronic component includes at least one light emitting diode (LED); and
the first substrate includes a lens in operative communication with the at least one LED.

[c7] 7. The mounting structure as set forth in claim 5, wherein:
the at least one first optoelectronic component includes a plurality of light emitting diodes (LED's) disposed on the substrate; and
the printed circuit board includes an electrical path that electrically interconnects the LED's disposed on the substrate.

[c8] 8. The mounting structure as set forth in claim 7, wherein:
the thermally conductive layer has depressions in which the LED's are arranged; and
the printed circuit board has holes arranged to allow the LED light emission to pass through.

[c9] 9. The mounting structure as set forth in claim 1, further comprising:
a third substrate on which at least one third component is arranged, the third substrate being in the shape of a rhombus and having a first edge connector disposed on an edge thereof which operatively connects with a second edge connector of the first substrate, and having a second edge connector disposed on an edge thereof which operatively connects with a second edge connector of the second substrate, the first, second, and third rhombus-shaped substrates being arranged to form a hexagonally shaped mounting structure.

[c10] 10. The mounting structure as set forth in claim 1, further comprising:
at least one terminating element that completes an electrical circuit.

- [c11] 11 .The mounting structure as set forth in claim 7 , further comprising:
at least one terminating element which supplies electrical power to the
mounting structure.
- [c12] 12 .A modular mounting assembly for connecting a plurality of light emitting
diodes (LED's) in a selectable electrical and spatial arrangement, the mounting
assembly comprising:
a plurality of substrates, each substrate having:
at least one LED fixedly arranged thereon, and
a plurality of connectors arranged thereon that are in electrical communication
with the at least one LED fixedly arranged thereon,
wherein the plurality of substrates are arranged in a spatial arrangement having
selected pairs of connectors in electrical communication with each other
providing an electrical arrangement between the plurality of LED's.
- [c13] 13 .The modular mounting assembly as set forth in claim 12 ,further
comprising:
an interconnecting element that electrically and structurally interconnects
selected substrates through pairs of connectors.
- [c14] 14 .The modular mounting assembly as set forth in claim 13 ,wherein:
the interconnecting element cooperates with the selected substrates to form
one of a series LED electrical interconnection and a parallel LED electrical
interconnection.
- [c15] 15 .The modular mounting assembly as set forth in claim 12 ,wherein:
at least one of the plurality of substrates has a rhombic shape.
- [c16] 16 .An extensible LED structure comprising:
an LED supported by a rhomboidal shaped substrate; and
at least one electrical socket disposed on the rhomboidal shaped substrate and
shaped to receive an electrical plug, the electrical socket providing electrical
communication to the LED.
- [c17] 17 .The extensible LED structure as set forth in claim 16 , further comprising:
a discrete plug which mechanically connects the electrical socket to an electrical

socket disposed on a second substrate.

[c18] 18. The extensible LED structure as set forth in claim 16, further comprising:
a plug integral with the substrate, the plug mechanically connectable to an
electrical socket disposed on a second substrate.

[c19] 19. The extensible LED structure as set forth in claim 16, where the plug
comprises electrical paths and when the plug is seated in the socket, the
electrical paths place the LED in a predetermined electrical relationship with an
LED on the second substrate.

11. The extensible LED structure of claim 10, wherein the first substrate is a flexible substrate, and the second substrate is a rigid substrate.